United States Patent

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[54] **DETACHABLY MOUNTED ARCHERY BOW STABILIZING DEVICE**
7 Claims, 4 Drawing Figs.

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[51] Int. Cl. F41b 5/00
[50] Field of Search 124/23, 24, 22, 30, 41; 188/Inq; 248/2, 18, 20, 14, 19

[56] References Cited
UNITED STATES PATENTS

645,057	3/1900	Ayers et al.	248/18
3,412,725	11/1968	Hoyt	124/30X

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ABSTRACT: An archery bow stabilizer having an isolated shock cushion mounting base providing ready attachment to and removel from the bow of weighted heads and rods of various masses and lengths, respectively. A resilient, compressible elastomeric bushing in the base provides a captive support for attaching the rod and head to the archery bow.

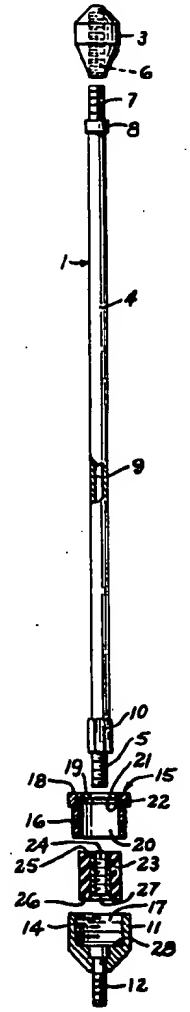

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Fig. 1.

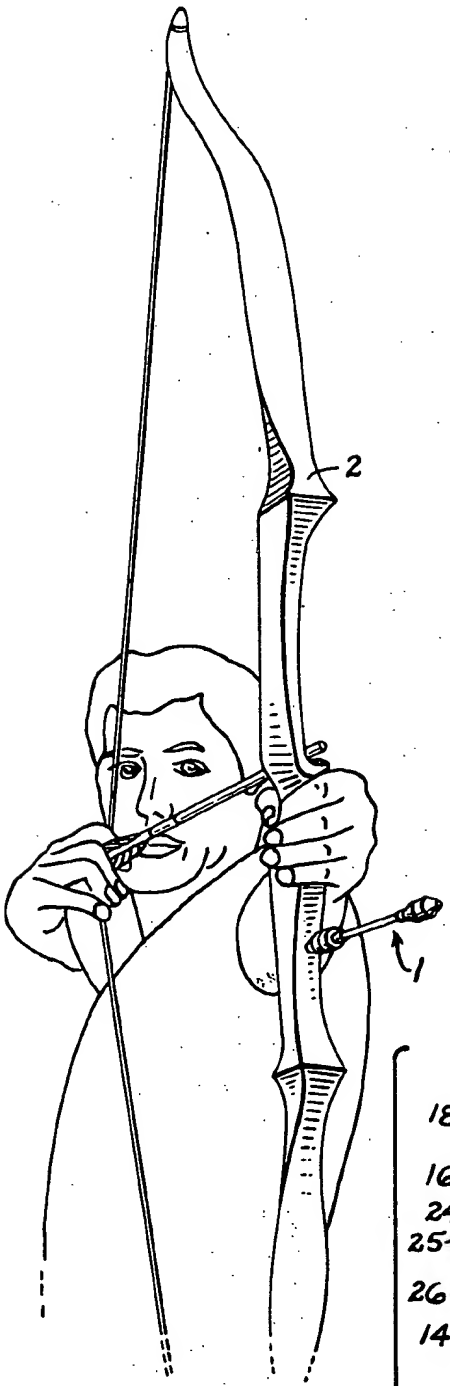


Fig. 3.

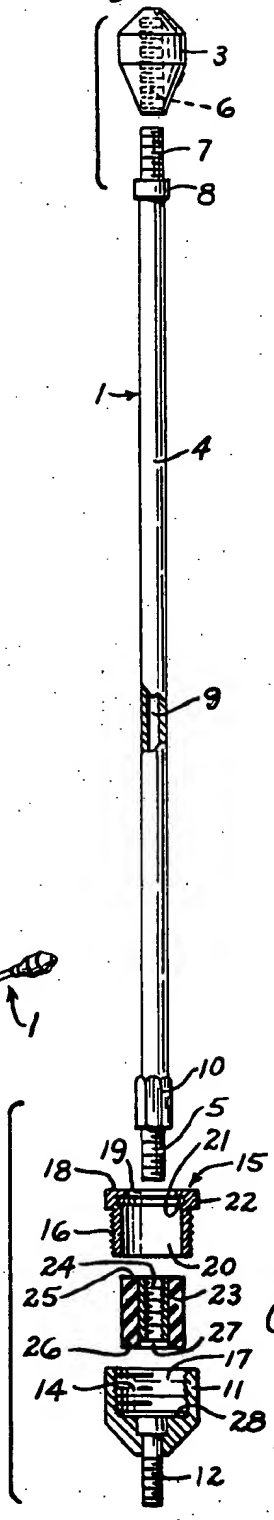


Fig. 4.

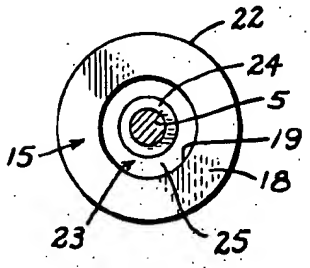
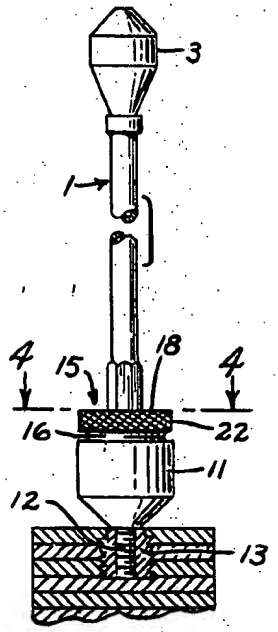


Fig. 2.



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DETACHABLY MOUNTED ARCHERY BOW STABILIZING DEVICE

This invention relates generally to an archery accessory and more particularly to an inertial stabilizer adapted to be readily attached to practically all types of archery bows for the purpose of reducing vibration and torque of the bow during shooting thereof with the result that a far more consistent and accurate cast may be obtained by the archer's arrows.

One of the heretofore unavoidable occurrences following the archer's release of an arrow has been the tendency of the bow to be laterally and rotationally displaced, that is, the handle section of the bow moves in a vibrating manner in a direction away from the arrow as it passes around the bow handle. Inasmuch as the ultimate cast of the arrow is affected throughout the time the bow string is moving from its retracted position to its forwardmost position due to the constant pressure exerted on the arrow nock by the bow string, it follows that any concurrent rotational displacement of the handle section or arrow rest of the bow during this period must ultimately affect the resulting cast of the arrow; accordingly it will be readily appreciated that any efforts made to inhibit or dampen this displacement of the bow by increasing the stability thereof will be a great advantage to the archer.

Efforts have been made in the past to achieve the foregoing accomplishment by the provision of weighted elements rigidly attached by various means to either face of the bow and even the sides thereof; however for the most part these prior efforts have fallen short of providing the necessary stabilizing and dampening action required to achieve the most consistent and accurate arrow passage from the bow. It is known that a limited degree of bow rotation is necessary to insure proper passage of the arrow from the bow, and without the use of any stabilizing means at all this bow rotation occurs in too great a degree and begins too early following the arrow release thereby precluding a smooth follow-through during release of the bow string. In other words, it has been established that inertia stabilizing means is definitely an advantage; however to be entirely satisfactory it must provide the proper dampening action while not restricting the necessary bow rotation.

To create a faster dampening action by counteracting the shock and vibration of the bow limbs after the arrow is released several variables must be taken into account, namely the bow weight, arrow mass weight, arrow spine and the archer's bow grip and arrow release. All of the foregoing must be considered in the provision of stabilizer means for an archery bow. Quite obviously, neither the manufacturers or the archers would consider maintaining a stock of an infinite number of heavy weighting components in order to provide required inertial stabilization when confronted with any one of the numerous shooting circumstances. A compromise system has been previously offered wherein an adjustably positioned weight may be rigidly attached to the back face or sides of the bow. Such an arrangement would provide the selection of various inertial turning moments available under certain conditions, but would fail to create the desired rapid damping action so necessary to insure the most true arrow flight and would not encompass all of the possible shooting circumstances likely to be encountered.

Accordingly, one of the primary objects of the present invention is to provide an improved inertial stabilizer adapted for use with an archery bow.

Another object of the present invention is to provide an archery bow stabilizer creating a faster dampening action upon release of the arrow, whereupon delayed vibrations are subsequently set up to offset the natural vibrations of the bow.

A further object of the present invention is to provide an inertial stabilizer for an archery bow including a coupling assembly permitting the interchange of selected dampening elements to accommodate various shooting circumstances.

Still another object of the present invention is to provide an archery bow stabilizer including a weighted head removably attached to the bow in an isolated manner by means of a shock cushion assembly.

A further object of the present invention is to provide an inertial stabilizer for an archery bow including a weighted head supported upon the bow without any rigid metal contact between the weighted head and the archery bow.

With these and other objects in view which will more readily appear as the nature of the invention is better understood the invention consists in the novel construction, combination and arrangement of parts hereinafter more fully described illustrated, and claimed.

A preferred and practical embodiment of the invention is shown in the accompanying drawing, in which:

FIG. 1 is a perspective view showing a general arrangement of the present invention as applied a to an archery bow.

FIGURE 2 is a partial side elevation, with portions partly in section, and discloses the present invention as mounted upon an archery bow.

FIGURE 3 is an exploded side elevation, partly in section, of the present invention.

FIGURE 4 is a transverse sectional view taken along the line 4-4 of **FIGURE** 2.

Similar reference characters designate corresponding parts throughout the several views of the drawing.

Referring now to the drawing, more particularly **FIGURE** 1, the invention will be seen to comprise an inertial stabilizer, generally designated **1**, projecting from the back face of an archery bow **2** at a point immediately below the hand grip. The exact positioning of the stabilizer forms no part of the present invention, as quite obviously it could be affixed to any one of other areas of an archery bow. The object of a stabilizer is to provide a weighted head **3** of significant mass on the outer end of a an elongated arm or rod **4** which is secured at its other end to the body of the bow **2**. It has been found that to merely directly attach the threaded support end **5** of the rod **4** to the bow provides a stabilizing device which falls far short of achieving the optimum results when used by the archer due to the excessive vibrations set up in the bow immediately following the release of the arrow and before the arrow has completed its passage across the arrow rest, which action creates an instability in the movement of the arrow that is hardly corrected by the delayed stability set up in the bow when the stabilizer actions become apparent. The present invention, however, includes an isolated shock cushion mounting of the stabilizer rod **4** to the body of the bow such that a much more rapid dampening action will take effect and the absorbed forces in the weighted head **3** will be released as delayed vibrations to offset the natural vibrations of the bow immediately prior to the arrow shaft leaving its contact with the arrow rest portion of the bow.

As shown in **FIGURE** 3 a weighted head **3** is provided with internal threads **6** adapted to engage the threaded head stud **7** which is attached to the rod **4** by means of a collar **8**. The rod **4** is preferably of tubular construction as shown at **9**, the object of which is to reduce as much as possible the weight of the rod itself thereby concentrating as much of the resulting inertial force as possible to the weighted head **3** removably attached to the outer end of the rod **4**. The inner end of the rod is equipped with an externally threaded stud **5** and may include a suitable nut **10** to assist in the assembly and disassembly of the stabilizer.

The weighted rod **4** is attached to the bow **2** by means of a mounting base **11** having a threaded stud **12** axially extending from one end thereof. As shown in **FIGURE** 2 a suitable insert **13** is embedded within the bow at the desired point of attachment for the inertial stabilizer, and in this instance includes a threaded aperture into which the stud **12** of the mounting base **11** may be threaded. Thus, it will be understood that the mounting base **11** will be the sole component of the stabilizer which will be rigidly attached in a non-vibratory manner to the body of the bow. Cooperating with the mounting base **11** which includes an inner well **14** having internal threads therein is a plug cap, generally designated **15**, which in turn includes a depending skirt **16**, the outer walls of which are formed with an external thread providing a mating

fit with the threads 17 comprising the side wall of the well 14. The outer face 18 of the plug cap 15 includes a central aperture 19 which communicates with the cavity 20 within the skirt of the cap and also forms a shoulder 21 which will be seen in FIGURE 3 to extend inwardly a greater distance than the inner wall of the cavity 20. The outer portion of the plug cap also includes a knurled periphery or rim 22 to enable ready manual assembly, adjustment and removal of the plug cap 15 with respect to the mounting base 11.

Prior to assembly of the plug cap and mounting base a compressible sleeve type bushing 23 formulated of any suitable elastomeric type material is positioned within the cavity 20 of the plug cap 15. The central portion of the cylindrical sleeve or bushing 23 is provided with an axial bore within which is disposed a threaded tubular insert 24, the threads of which mate with the male threads on the support stud 5 of the rod 4. As will be clearly seen in FIGURE 3 the insert 24 which is securely mounted within the bushing 23 is flushly disposed with respect to the outer end 25 of the bushing while the opposite end of the insert is set back or recessed from the inner end 26 of the bushing to provide an insert clearance 27.

Certain requirements are necessary to insure satisfactory operation of the above described isolated shock cushion mounting components. First, the outer diameter of the compressible bushing 23 is selected to provide a close sliding fit with the walls of the cavity 20 of the plug cap 15 while the overall axial length of the bushing 23 is of an extent greater than the interior axial dimension of the plug cap from the inner surface of the shoulder 21 to the free edge of the skirt 16 such that when the compressible bushing 23 is inserted within the cavity 20 and the outer end 25 thereof abuts the shoulder 21 of the cap then the inner end 26 will project outwardly from the bottom of the skirt 16 a measurable amount. In the normal unstressed condition the previously described clearance 27 between the inner end of the threaded insert 24 and the inner end of the sleeve bushing 26 will exist as shown in FIGURE 3 of the drawing. Likewise, the inner periphery of the cap which forms the aperture 19 is of a diameter substantially greater than the outer diameter of the outer end of the tubular element 24 such that the compressible material of the bushing will, at all times, preclude metal to metal contact at the outer end of the assembled plug cap and compressible bushing.

The shock cushion mounting assembly is completed by joining the plug cap 15 having the bushing 23 therein to the mounting base 11 by means of the cooperating threads thereon, it being understood that the axial length of the skirt 16 is preferably greater than the axial extent of the well 14 in the mounting base 11 in order to prevent contact between the undersurface of the rim 22 of the cap and the free outer edge of the juxtaposed portion of the mounting base 11 when all components are fully assembled. While assembling these components it is only necessary to turn the cap 15 by means of the knurled rim 22 with the fingers until the inner end 26 of the compressible bushing 23 engages the planar bottom wall 28 of the mounting base well 14. At this point a substantial resistance is met to the continued tightening of the plug cap; however due to the elastomeric property of the resilient portion of the bushing 23 it will be understood that by increasing the effort required to turn the rim of the cap 15 this cap may be further rotated and thus moved downwardly toward the bottom wall 28 of the mounting base 11, during which continued tightening the body of the resilient portion of the bushing will be substantially compressed due to the force exerted by the shoulder 21 on the cap and the captivating wall 28 of the base 11. Inasmuch as the tubular insert 24 is rigidly affixed to the compressible portion of the bushing 23 and the outer periphery of the bushing 23 initially provides a close fit with the walls of the cap cavity 20, it will follow that this compression of the bushing material will primarily result in a flattening of the inner end 26 thereof to radially and inwardly displace the resilient composition into the area formerly forming the insert clearance 27.

The foregoing assembly operation results in a highly densified yet still resilient support of the threaded tubular insert 24 within the confines of the plug cap 15 and mounting base 11 without the presence of any metal to metal engagement between the tubular insert 24 and the other metal components of the assembly with the fixed mounting base 11. In order to attach the stabilizer rod 4 and its mounted head 3 to the shock cushion mounting the support stud 5, at the end thereof is threaded into the tubular insert 24 until the shoulder formed by the rod nut 10 which engages the outer end of the tubular insert. Quite obviously, the axial length of the stud 5 is short of the overall length of the tubular insert 24 to insure that there is no metal to metal contact between the free end of the stud 5 and the bottom wall 28 of the mounting base 11 even when the plug cap has been fully tightened within the mounting base.

The thus assembled stabilizer device may then be readily attached to the bow 2, for example, by engaging the mounting stud 12 connected to the mounting base 11 with the threaded insert 13 securely anchored within the body of the bow.

In view of the foregoing description, several features will now be readily appreciated. Quite obviously, heads 3 of different masses may be quickly attached to the stud 7 of the stabilizer rod 4 to alter the inertial characteristics of the device according to the shooting conditions being encountered, and when the proper weighted head 3 is selected will serve in a superior manner due to the substantially lighter mass of the hollow or tubular rod 4 which places the maximum mass at an extended position from the bow itself. Another variable is the length of the tubular rod 4 itself, which may of course be altered to place the weighted head 3 at different lengths from the bow 2. The unique construction of the isolated shock cushion mounting of the present invention also provides for another variable component. The density of the compressible bushing 23 as used between the mounting base 11 and plug cap 15 may be altered, whereby the stabilizing effect of any one rod 4 and head 3 will be determined by the density of the specific compressible bushing 23 being used. This important variable will be readily appreciated when it is understood that the material forming the resilient portion of the bushing 23 is the sole connecting means for the entire mass of the head 3 and rod 4 and the bow-attached mounting base 11.

I claim:

1. An inertial stabilizer for an archery bow comprising, a weight means, a mounting base having an inner well provided with a bottom wall and threads and adapted to be secured to a bow, a cap having a central aperture and a threaded skirt so that the cap may be the threadably attached to the mounting base, a resilient elastomeric cylinder positioned within the skirt and having a bore supporting the weight means, the portion of the cap surrounding the aperture constituting a shoulder that engages the upper end of the resilient cylinder, said resilient cylinder extending the length of the inner well and bearing against the bottom wall of the well at one end and against the cap at the other end, said weight means being anchored within said bore of said resilient means and extending outwardly therefrom through said aperture, whereby said weight means is supported in a manner fully isolated from said cap and said base by said resilient means.

2. An inertial stabilizer according to Claim 1, wherein, said weighted means includes a head attached to the outer end of a rod, threads on the inner end of said rod, and means in said resilient means for removably attaching said threaded portion of said rod to said resilient means, whereby, metal to metal contact is excluded between said rod and base.

3. An inertial stabilizer according to Claim 2, wherein, said rod is a hollow tube.

4. An inertial stabilizer according to Claim 1, wherein said bore of said resilient cylinder is provided with a rigid insert and said weighted means is connected to said insert.

5. An inertial stabilizer according to Claim 1, wherein said resilient cylinder is of compressible material having a rigid insert disposed within said bore, and said weighted means is connected to said insert.

6. An inertial stabilizer according to Claim 5, wherein, said insert is recessed from that portion of said cylinder adjacent said base.

7. An inertial stabilizer for an archery bow, comprising, a mounting base adapted to be secured to the bow, a cap removably attached to said base, resilient means disposed between said cap and base, said resilient means comprising a unitary elastomeric sleevebushing, bearing at one end against said cap and at the other end against said base, said cap including an aperture in the outer face thereof, an insert fixedly disposed within said bushing, said cap including a skirt having an internal cavity, and the diameter of said aperture is less than the diameter of said cavity and greater than the outer diameter of said insert, weighted means connected to said insert and extending outwardly therefrom and through said cap aperture, and threaded connecting means on said cap and base selective to permit adjustment of the axial displacement between said cap and base, whereby, adjustment of said connecting means alters the compression of said resilient means.